

Chapter 21

Modeling for Research and Communication

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ABSTRACT

- Modeling the MISA Instructional Engineering Method
 - Modeling Productions, Tasks and Principles
 - Summary of the MISA R&D Process
- Modeling Assistance for a host system
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 - Summary of the Advisor System Research Process
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 - Three Thesis on Cognitive Computing and the Semantic Web
 - Summary of the Research Process

In this concluding chapter, we will give examples where visual modelling techniques have been used in actual research projects. Visual Modelling is particularly useful to the researcher both to organize and guide the research and to communicate its results. Our Research Centre applied this approach in numerous research projects since its creation in 1992.

We will start by showing how visual modelling has helped develop a coherent view of Instructional Engineering that led to the design of the MISA

DOI: 10.4018/978-1-61520-839-5.ch021

method through a number of years. Then we will present another stream of research that has also been supported by knowledge modelling: the development of assistance systems. Finally, we will conclude the chapter by presenting a method that has been used by several doctoral students, in particular by those responsible of the projects presented in section III of this book. These examples will enable us to propose a generic meta-method for research projects and doctoral work that will serve as a conclusion to this chapter.

21.1 MODELING THE MISA INSTRUCTIONAL ENGINEERING METHOD¹

In many chapters of this book we have presented aspects of the MISA Instructional Engineering Method that make an extensive use of visual knowledge modelling for representing the content, pedagogical strategies, learning materials and delivery processes of learning environments. The reader can refer to chapter 8 for a short introduction to MISA and to the books that have been published on the subject (Paquette 2002, 2004) or to the author's Web site at www.lice.f.ca/gp.

Here, we are interested in modelling the process and its products that have led to the MISA method and its various tools. Without such a process, refined through the years, it would have been impossible to keep a focused and coherent view on MISA's Evolution and the development of its related tools.

Modelling MISA's Productions, Tasks and Principles

Throughout these research process we asked ourselves, what is it exactly that the designer has to produce, what are the tasks that will enable him to achieve these productions, how are they related, and what are the principles that should guide de-

signers to better quality products. These are quite general question that are present when designing a new methodology, whatever the application domain. These questions led us to build a visual model of MISA with the MOT editor that shows the interrelations between all these elements of the method. In this section, we present the MOT model of MISA 4.0. Another MISA-based model of the method for IMS-LD can be consulted at www.idld.org in the methodological aids section.

The first question was: what is it that an instructional designer supposed to produce? Our answer was: a learning system (or IT-supported environment) in all its dimensions. This led us to a general model of this concept shown on Figure 1. A learning system is composed is produced by an instructional engineering process and is an input to the delivery of the system. It is composed of two elements: a set of specifications or "blueprint", produced using MISA, and the "Physical" system composed of learning materials and support infrastructures.

The role of MISA is to support the production of a blueprint or specifications of a learning system composed of a knowledge and skills model, a pedagogical model grouping learning units and their learner or teacher interrelated activities, a media model to guide the development of the learning material, and a delivery model to define the human and technical infrastructure needed to support the LS when it will be in use.

Analysing these tasks more closely and their interactions, we found out that they had to be developed progressively, as in most method, in a number of phases. We retained the following phases.

- Define the Training Problem and Customize MISA
- Define a Preliminary Solution
- Build the Learning System's Architecture
- Design Instructional Materials
- Produce and Validate the Materials

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